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(12) United States Patent

Woolfson et al.

(54) PERSONAL WATER AND ADDITIVE APPARATUS

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See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS

1,707	7,058	Α		3/1929	Kauwertz
3,348	3,737	A	*	10/1967	Yingst et al 222/58
3,411	,534	Α	*	11/1968	Rose 137/595

(10) Patent No.: US 7,533,786 B2 (45) Date of Patent: May 19, 2009

3,463,361 A	8/1969	Cook et al.
4,681,244 A *	7/1987	Geddie 222/144.5
4,692,144 A	9/1987	Carpenter
4,815,635 A	3/1989	Porter
4,821,895 A	4/1989	Roskilly
5,188,019 A *	2/1993	Vahabpour 99/285
5,188,090 A *	2/1993	Griggs 126/247
5,249,702 A	10/1993	Topp et al.

(Continued)

FOREIGN PATENT DOCUMENTS

AU 534984 2/1984

(Continued)

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(57) ABSTRACT

A personal water and additive apparatus includes a first container; a manifold having a water passageway and an additive passageway, the water passageway and additive passageway intersecting to form a single mixing passageway; a first tube connecting the first container to the water passageway of the manifold, the combination of the first tube and the water passageway defining a water channel; a second container; a second tube connecting the second container to the additive passageway of the manifold, the combination of the second tube and the additive passageway defining an additive channel; an outlet tube having one end connected to the mixing passageway of the manifold; a check valve disposed in the water channel; and a flow regulator that controls flow in at least one of the water passageway and the additive passageway.

17 Claims, 4 Drawing Sheets

